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## (54) Freezing and dispensing ice-cream

(57) A method of preparing a dispensing receptacle containing a single item or a plurality of items of frozen product such as ice-cream involves placing the product in a flowable state in a first part-mould (3) and in a second part-mould (2), cooling both part-moulds until the product is substantially all frozen, placing the part-moulds (2) together so that exposed surfaces of the product in each come into contact, and thereafter freezing the product as an integral whole. The part-moulds (2) are advantageously retained together during the latter freezing stage, and conveniently the part-moulds are made of a thermoplastic sheet materials which can be caused to coalesce by heating at selected points (9).

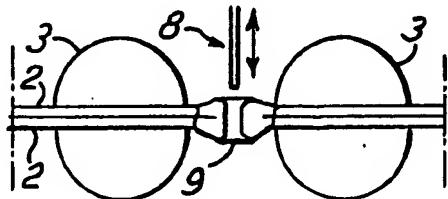
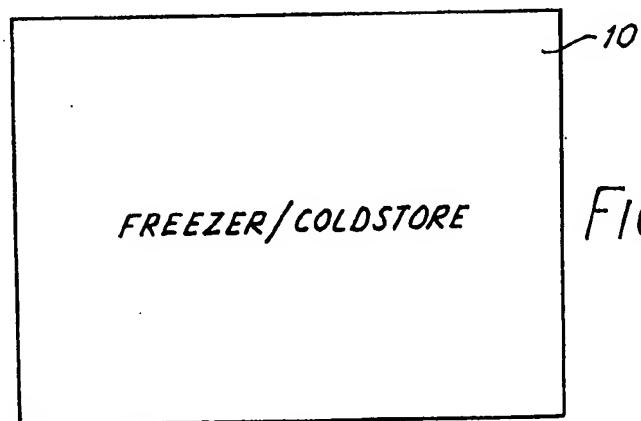
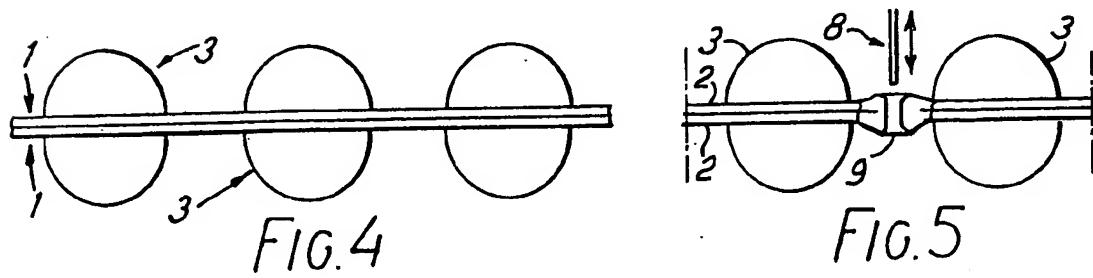
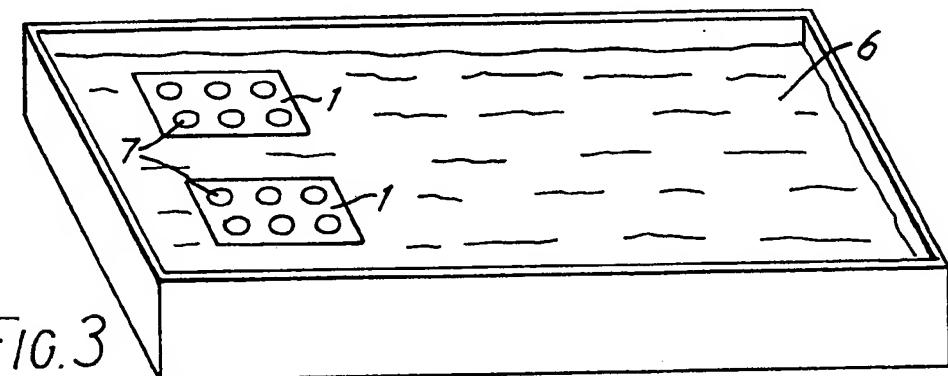
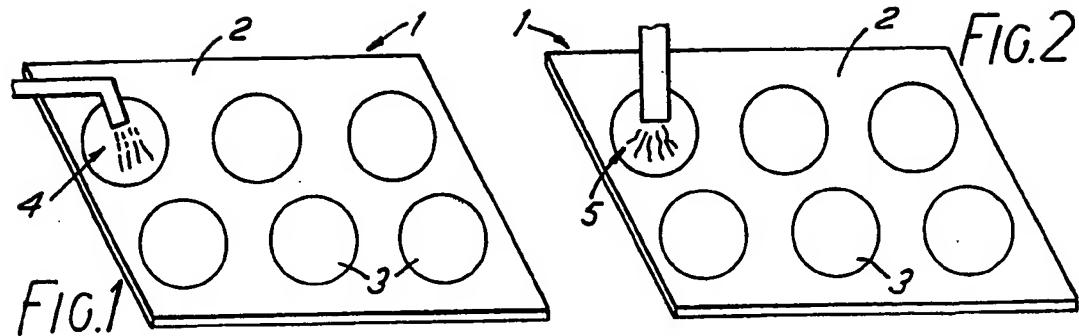


FIG.5

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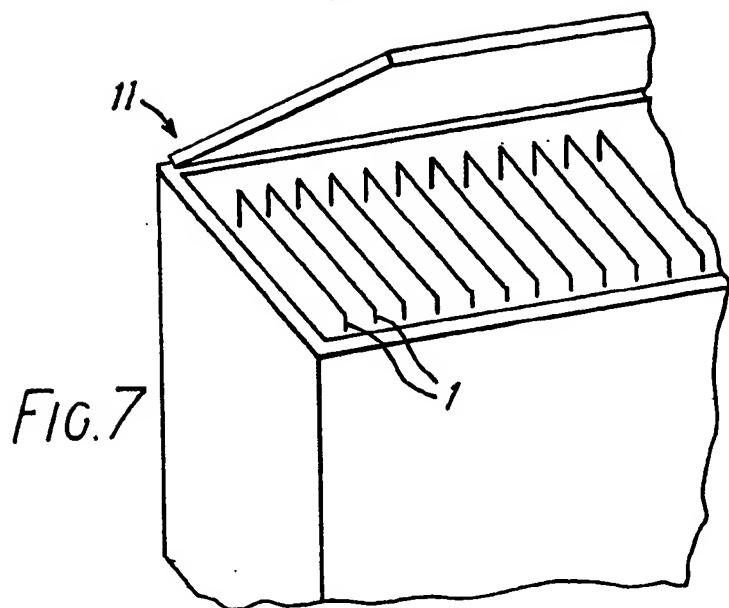


FIG. 7

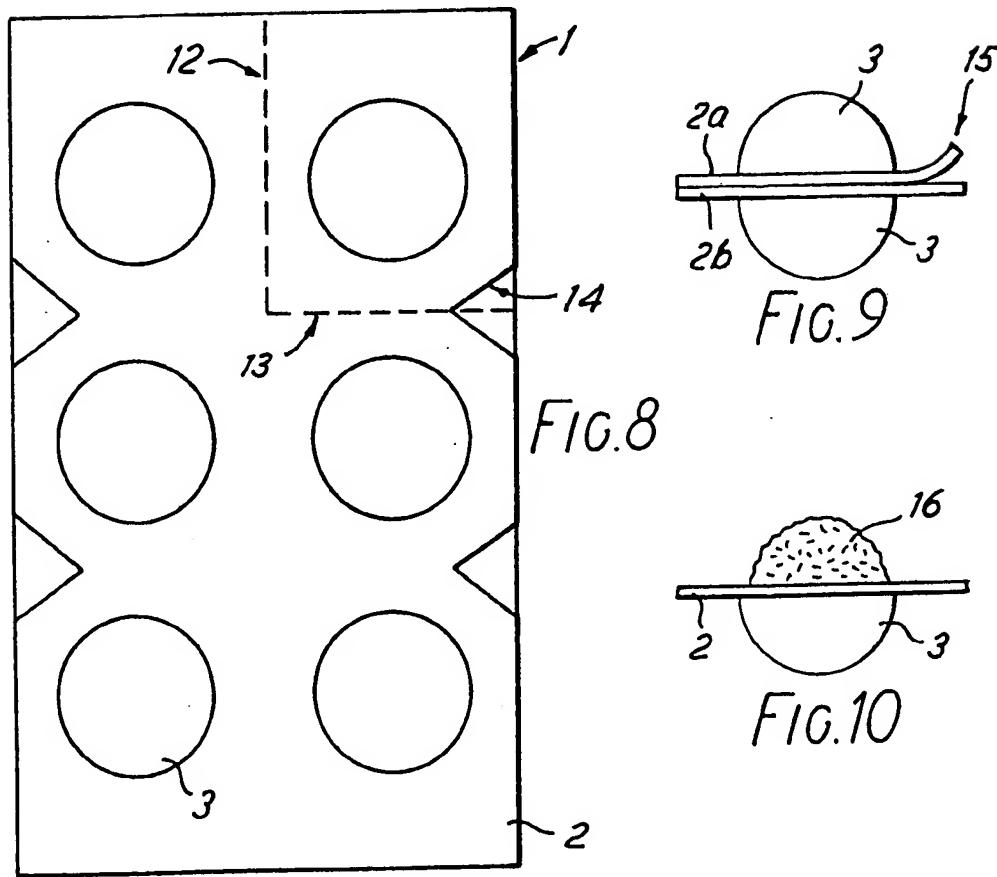


FIG. 8

FIG. 9

FIG. 10

## SPECIFICATION

## Method and apparatus for frozen products

5 This invention relates to a method and apparatus for the production and handling of frozen products, and dispensing receptacles containing frozen product which are manufactured thereby. Although the invention is of particular application in the production of ice cream in the form of shaped end products, it is not restricted to such material, but for convenience of illustration the following description will refer in greater detail to the production of ice cream balls for use on ice cream cornets.

10 The object of the invention is to provide improvements in the preparation of a shaped frozen product, and in the storage thereof, and in the eventual dispensing thereof.

15 According to the present invention, a method of preparing a dispensing receptacle containing a frozen product comprises:

20 (i) placing a first quantity of the product, in a flowable state, in a first part-mould,

25 (ii) placing a second quantity of the product, in a flowable state, in a second part-mould,

30 (iii) cooling both of the part-moulds until the product therein is substantially all frozen,

35 (iv) placing the part-moulds together so that an exposed surface of the first quantity of product is able to contact an exposed surface of the second quantity of product,

40 (v) with the part-moulds being retained together, freezing the quantities of product as an integral whole.

Further according to the invention, a method of preparing a multiple dispensing receptacle containing a plurality of items of

45 frozen product comprises:

(i) placing first quantities of the product, in a flowable state, into respective cavities of a first part-mould,

50 (ii) placing second quantities of the product, in a flowable state, into respective cavities of a second part-mould,

(iii) cooling both of the part-moulds until the product therein is substantially all frozen,

55 (iv) placing the part-moulds together so that an exposed surface of each first quantity of the product is able to contact an exposed surface of a respective second quantity of the product,

(v) with the part-moulds being retained together, freezing the quantities of product to form respective integral wholes.

In a preferred embodiment, the part-moulds are secured together during the freezing step, and in a convenient manner the part-moulds

60 are made of thermoplastic material and are secured together by application of heat at one or more positions so as to cause coalescing of the material of the part-moulds.

Prior to introduction of the quantities of

65 product into the part-moulds, advantageously

each part-mould is treated with an anti-stick preparation.

The cooling of the part-moulds until the product therein is substantially all frozen may conveniently be carried out by floating the filled part-moulds on a brine bath.

According to a further feature of the invention, dispensing of the integral shaped frozen product from the retained-together part-

70 moulds comprises a step of separating the part-moulds such that the shaped frozen product remains in one of the part-moulds, from which it is thereafter removed. To facilitate such removal, advantageously at least one of the part-moulds has its mould cavity defined in a stiff but manually deformable material.

According to a further feature of the invention, where the frozen product is prepared in retained-together part-moulds having a plurality of cavities containing the product, corresponding portions of the two part-moulds may

75 be separated from the remainder, and thereafter one portion removed from the other to provide access to the frozen product. Advantageously, the part-moulds are made of a sheet material, such as a plastics material, which can readily be severed manually, e.g. sheet polyethylene or the like which can be cut with scissors.

80 90 95 According to a still further feature of the invention, each part-mould is in the form of a generally planar sheet having a plurality of mould cavities in it, and retained-together part-moulds are stacked side by side in vertical position in a cold storage structure, such that each individual pair of retained-together part-moulds can be withdrawn upwardly when required.

100 To facilitate separation of portions of the part-moulds, at least one of the part-moulds may have a notch formation permitting entry of a separating means, such as a finger nail or a knife edge or other tool, between overlying web portions of the part-moulds.

110 115 As a new industrial product, the invention provides moulds each consisting of two part-moulds secured face to face with their cavities aligned, each entire mould cavity containing an entire shaped frozen food product such as

120 125 130 In order that the nature of the invention may be readily ascertained, an example of a method and embodiments of apparatus for use therein and an end product obtained, in accordance with the invention, are hereinafter particularly described with reference to the figures of the accompanying drawings, wherein:

Figs. 1 to 7 illustrate, in sequence, a number of stages in the preparation of a filled multiple dispensing receptacle;

Fig. 8 is a plan view of the filled multiple dispensing receptacle;

Fig. 9 is a side elevation of an individual dispensing receptacle, after parting off from

the remainder;

Fig. 10 is a side elevation of the individual dispensing receptacle after removal of one portion of mould.

5 The preparation of ice cream in a shaped end product involves stages of preparation of a mix, placing mix into a mould, freezing, storing under low temperature, and removal of the shaped end product for dispensing. The 10 method and apparatus to be described are adapted for the preparation of substantially spherical portions of ice cream to be used in the making of ice cream cornets, but the invention is not limited to such items, and 15 details of mix, temperature, and shape are not essentials.

Referring to figure 1 of the drawings, use is made of a multiple dispensing receptacle which essentially comprises two part-moulds

20 1, placed eventually face to face. The part-mould 1 has a web area 2 and a plurality of mould cups 3, and the part-moulds are of similar shape and dimensions so that they can be placed in aligned pairs with the cups face to face to provide, in total, a substantially spherical mould cavity.

In carrying out the method of this invention, two of the part-moulds 1 are sprayed at 4, at least in the cups 3, with an anti-stick 30 preparation of known kind adapted to give easy release of frozen ice cream from a mould.

Referring to figure 2, each of the cups 3 of the two part-moulds 1 are then filled at 5 with 35 ice cream mix.

Referring to figure 3, the two part-moulds 1, with their liquid ice cream content, are then floated on a brine bath 6 until substantially the whole of the ice cream content 7 has 40 become set hard. In practice it is possible to time the operation such that the exposed under surface, i.e. most remote from the brine, is just about on the point of setting, and is still fluid or pasty or tacky.

45 The part-moulds 1 are then removed from the brine bath and (see fig. 4) are placed face to face. The ice cream content of the aligned opposed cups 3 then tends to merge together at the contacting exposed faces, so that the 50 ice cream content as a whole assumes a roughly spherical shape.

Referring now to figure 5, the two part-moulds 1, in face to face contact, are then secured together. In practice the part-moulds 55 1 are conveniently made of a heat-sealable plastics material, such as polyethylene, and a method of securing them together consists of passing a heated metal bit 8, similar to a wire bit of an industrial soldering iron, through the 60 web portion 2, thereby creating a fused mutual ring-shaped formation 9 similar in appearance to a hollow rivet.

Referring to figure 6, the assembled part-moulds 1,1 are then transferred to a freezer/- 65 coldstore apparatus 10 where the contents are

frozen hard, until the time comes for transfer to a sales point, such as a vehicle.

For retail sales purposes, the mould assemblies 1,1 are transferred to a freezer cabinet

70 11, wherein they are stacked vertically in parallel spaced position. In the drawings, the part-moulds 1 are shown for purposes of simple illustration as having only six mould cups 3, but in practice the part-moulds 1 may 75 be made much larger and may have, say, seventy-two or any desired greater number of such cups.

When stacked vertically in the cabinet 11, the mould assemblies 1,1 occupy only a small

80 space, and accordingly a very large number of the assemblies 1,1 can be stored in a cabinet of moderate dimensions, e.g. a cabinet in a small motor vehicle or in a shop. The possibility of having a relatively large number of 85 mould assemblies 1,1 in a single storage cabinet gives the possibility of the sales outlet having a relatively very large number of different flavours all available at the same time, but in a small space.

90 When it is desired, by the sales personnel, to dispense an ice cream portion from one of the mould assemblies 1,1, the assembly is drawn up out of the cabinet 11 to a sufficient extent, and the assembly 1,1 is then cut, e.g.

95 with a pair of scissors, successively along the lines 12,13 seen in figure 8. This separates off one pair of mould cups 3 with their frozen contents. One of the part-moulds 1 is made with cut-outs 14 with the result that when the

100 pair of mould cups has been parted off in this manner, it is then a simple manner to separate the two web portions 2a,2b (see Fig. 9) by lifting up a corner with the fingers, as seen at 15. The upper mould portion is lifted away

105 completely, leaving the ice cream product 16 exposed ready for placing into a cornet, the ejection of the ice cream product being facilitated by deformation of the mould cup 3 with the fingers. The emptied mould portions are

110 then discarded.

Thus, from the time of receipt of an order, the only actions required of the sales person are (i) to lift up the appropriate flavour-sheet of moulds, (ii) to cut along the lines 12,13

115 and replace the remainder of the sheet, (iii) to prise open the mould portions, and (iv) to eject the ice cream product into the cornet. There is no manual contact of the ice cream product, and it is not touched by any dispensing tool. Until the moment of ejection from the mould cup, the ice cream product is substantially hermetically sealed in the mould cups.

## 125 CLAIMS

1. A method, of preparing a dispensing receptacle containing a frozen product, comprising:

- (i) placing a first quantity of the product, in 130 a flowable state, in a first part-mould,

(ii) placing a second quantity of the product, in a flowable state, in a second part-mould,

(iii) cooling both of the part-moulds until the product therein is substantially all frozen,

(iv) placing the part-moulds together so that an exposed surface of the first quantity of product is able to contact an exposed surface of the second quantity of product, (v) with the part-moulds being retained together, freezing the quantities of product as an integral whole.

2. A method, of preparing a multiple dispensing receptacle containing a plurality of items of frozen product, comprising:

15 (i) placing first quantities of the product, in a flowable state, into respective cavities of a first part-mould,

(ii) placing second quantities of the product, in a flowable state, into respective cavities of a second part-mould,

(iii) cooling both of the part-moulds until the product therein is substantially all frozen,

(iv) placing the part-moulds together so that an exposed surface of each first quantity of 25 the product is able to contact an exposed surface of a respective second quantity of the product,

(v) with the part-moulds being retained together, freezing the quantities of product to 30 form respective integral wholes.

3. The method claimed in either of claims 1 and 2, wherein the part-moulds are secured together during step (v).

4. The method claimed in claim 3, wherein 35 part-moulds made of thermoplastic material are secured together by the application of heat at one or more positions to cause coalescing of the material of the part-moulds.

5. The method claimed in any one of claims 40 1 to 4 wherein each part-mould is treated with an anti-stick preparation prior to introduction of the quantity of product.

6. The method claimed in any one of the preceding claims, wherein the cooling of step 45 (iii) is carried out by floating the filled part-moulds on a brine bath.

7. The method, of preparing a dispensing receptacle containing a frozen product, substantially as described herein with reference to 50 figs. 1 to 6 of the accompanying drawings.

8. A dispensing receptacle, containing a frozen product, prepared by the method claimed in any one of claims 1 to 7.

9. A dispensing receptacle, as claimed in 55 claim 8, wherein at least one of the part-moulds has its mould cavity defined in a stiff but manually deformable material.

10. A multiple dispensing receptacle, prepared by the method claimed in claim 2, or in 60 any of claims 3 to 6 when made dependent upon claim 2, or in claim 7, wherein the part-moulds are made of a sheet material which can readily be severed manually.

11. A multiple dispensing receptacle, as 65 claimed in claim 10, wherein the part-moulds

are made of sheet polyethylene.

12. A dispensing receptacle, as claimed in either of claims 8 and 9, wherein at least one of the part-moulds has a notch formation 70 permitting entry of a separating means between overlying web portions of the part-moulds.

13. A multiple dispensing receptacle, as claimed in either of claims 10 and 11, 75 wherein at least one of the part-moulds has notch formations adascent to each mould cavity permitting entry of a separating means between overlying web portions of the part-moulds.

14. A single or multiple dispensing receptacle, containing a whole item of frozen product, substantially as described herein with reference to the figures of the accompanying drawings.

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